

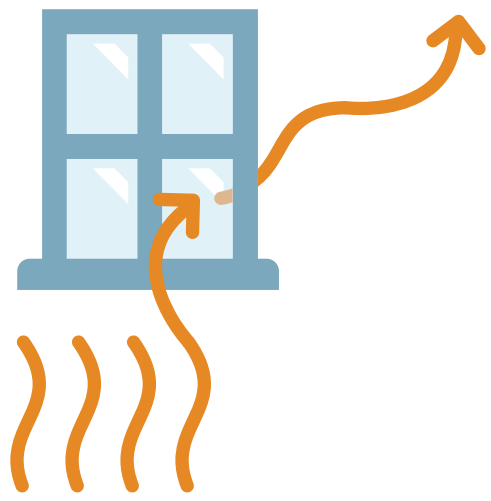
# HI-R LOW-E WINDOW RETROFIT SYSTEM

## OPPORTUNITY

How much energy is lost through inefficient windows in commercial buildings?

**23% ENERGY**

USED TO HEAT & COOL BUILDINGS IS LOST THROUGH INEFFICIENT WINDOWS<sup>1</sup>



## TECHNOLOGY

How do Window Panel Retrofits save energy?

**IMPROVE THERMAL PERFORMANCE**

WITH LOW-E WINDOW PANELS

**PRE-MANUFACTURED**

LIKE STORM WINDOWS; SIMPLIFYING INSTALLATION

## M&V

Where did Measurement and Verification occur?

**LAWRENCE BERKELEY NATIONAL LABORATORY** assessed the impact of Hi-R Low-e window panel retrofits provided by Serious Energy in a Provo, Utah federal office building.

## RESULTS

How did Window Panel Retrofits perform in M&V?

**41% HEATING SAVINGS IN WINTER<sup>2</sup>**

ESTIMATED SAVINGS FOR ENTIRE BUILDING HEATING AND COOLING: 11%<sup>3</sup>

**QUICK INSTALLATION<sup>4</sup>**

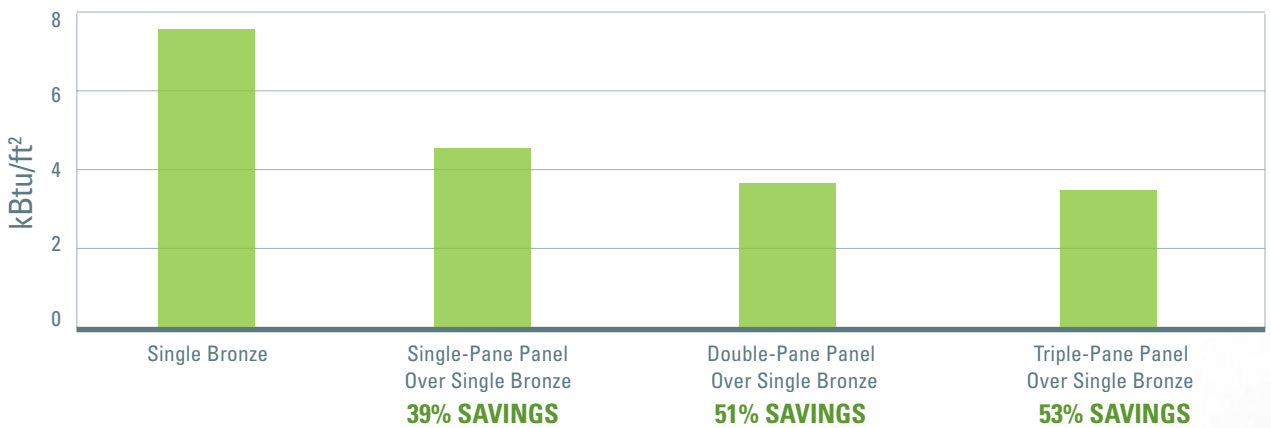
IMPROVED VISUAL AND THERMAL COMFORT<sup>5</sup>

**<9 YEARS**

PAYBACK FOR TRIPLE-PANE; DOUBLE-PANE WILL BE SHORTER<sup>6</sup>

## Savings Diminish with Triple-Pane Hi-R Window Panel Retrofit

COMFEN results compared to base configuration of single pane with bronze film



## DEPLOYMENT

Where does M&V recommend deploying Window Panel Retrofits?

**BUILDINGS IN COLD CLIMATES**

WITH SINGLE-PANE WINDOWS

Double-pane retrofits recommended, as triple-pane offers diminishing returns. Site-specific evaluation is critical.

<sup>1</sup>Highly Insulating Window Panel Attachment Retrofit. Charlie Curcija, Howdy Goudey, Robin Mitchell, Erin Dickerhoff (LBNL), December 2013, p.3 <sup>2</sup>Ibid, p.26 <sup>3</sup>Ibid, p.39 <sup>4</sup>Ibid, p.7 <sup>5</sup>Ibid, p.26,35 <sup>6</sup>Ibid, p.2